



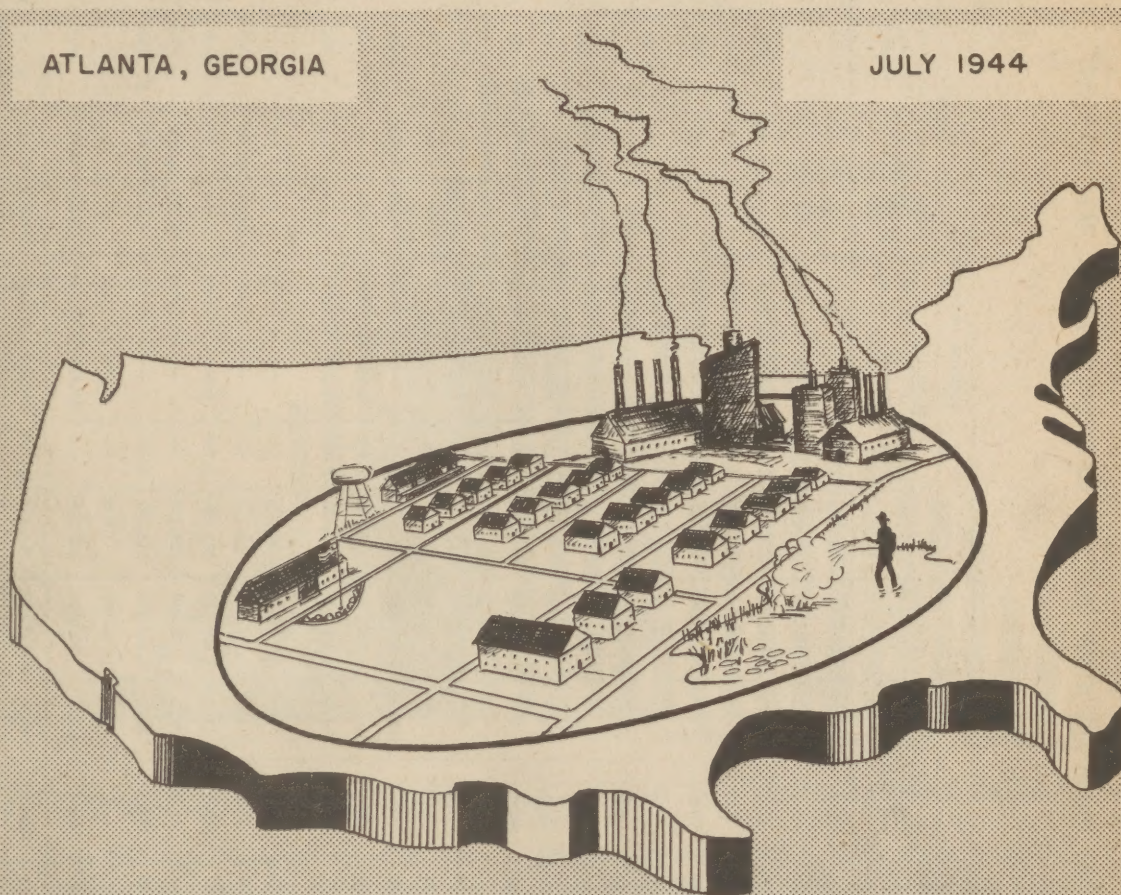
# FIELD BULLETIN

IN-SERVICE TRAINING AND INFORMATION

MALARIA CONTROL IN WAR AREAS

ATLANTA, GEORGIA

JULY 1944



SUMMARY OF FIELD ACTIVITIES, APRIL, MAY, JUNE.  
DENGUE CONTROL IN THE HAWAIIAN ISLANDS

RESTRICTED



TABLE I. MCWA LARVICIDE, MAJOR AND MINOR DRAINAGE WORK DURING APRIL, MAY, AND JUNE\*

STATE	Areas in Operation	War Establishments Protected	LARVICIDAL WORK				DRAINAGE OPERATIONS										Total	
			Larvicide Used	Surfaces Treated		Clearing	Cleaning	New Ditching			Ditch Lining Placed	Underground Drainage	Fill	Water Surf. Eliminated	Man Hours			
			Oil Gals.	Paris Green Lbs.	Cilled Acres	Removal Surf. Veg. Acres	Sq. Ft.	Hand	Lin. Ft. Mach.	Dynamite Cu. Yds.	Lin. Ft.	Sq. Ft.	Lin. Ft.	Cu. Yds.	Acres	Man	Hours	
Alabama	6	73	2,599	130	110	26.7	1,172,101	27,015	---	1,200	---	---	---	268	19.8	33,062		
Arkansas	15	70	49,974	2,103	3,023	197.1	820,307	73,595	35,980	2,300	---	---	---	33	25.5	78,733		
California	4	29	10,566	---	1,117	7.4	576,995	24,810	---	---	---	500	---	---	68.6	11,426		
D. C.	1	25	---	---	---	1.8	55,296	13,723	---	---	---	---	---	110	0.6	5,351		
Florida	17	141	14,158	687	896	92.8	7,785,585	136,321	8,396	36,290	30	100	15,033	379.6	111,236			
Georgia	13	101	1,251	4,203	52	117.8	785,642	31,231	3,316	---	770	1,955	45	3,097	29.0	80,135		
Illinois	2	56	1,710	170	53	10.9	48,000	2,955	---	---	---	---	---	---	15.0	8,122		
Indiana	2	144	---	160	---	1.9	104,000	250	---	---	---	---	---	---	---	3,667		
Kentucky	3	45	2,165	22	164	11.0	32,814	5,696	---	1,260	---	---	12	---	6.8	12,537		
Louisiana	8	68	269,598	15,129	13,043	156.1	1,044,045	164,442	---	---	---	70	18,719	78.3	200,852			
Maryland	1	29	---	---	---	2.5	117,171	6,660	---	5,360	---	---	---	---	---	9,054		
Massachusetts	---	---	450	18	34	---	---	---	---	---	---	---	---	---	---	864		
Mississippi	11	55	40,919	1,006	1,119	176.9	2,106,851	31,187	---	---	1,135	5,283	74	23.9	71,372			
Missouri	5	34	9,197	3,330	1,291	25.6	201,170	15,369	600	4,550	---	---	193	11.5	21,588			
North Carolina	10	72	3,133	96	121	403.4	1,570,797	144,584	2,686	18,656	---	---	814	365.4	109,015			
Oklahoma	8	38	10,362	208	678	71.4	615,710	58,264	---	---	---	---	---	8	98.3	32,282		
Puerto Rico	6	19	5,104	10,265	160	77.5	2,052,793	118,767	---	---	19,714	20,217	3,059	24.3	178,185			
South Carolina	20	111	21,592	710	1,574	259.5	3,908,815	107,264	1,232	6,200	---	---	8,625	107.2	160,719			
Tennessee	5	69	15,160	494	706	11.2	36,210	18,307	---	---	4,827	14,552	963	1,609	18.1	36,546		
Texas	13	164	45,920	459	2,175	297.3	1,447,838	114,451	8,600	---	2,161	10,982	150	635.9	139,174			
Utah	---	---	60	38	4	---	12,000	3,800	---	---	---	---	---	---	4.0	2,112		
Virginia	4	99	5,553	3,706	163	121.3	109,875	149,916	---	33,091	3,110	8,720	---	---	---	82,192		
Total	153	1,298	509,761	42,934	26,793	2,100.1	20,933,925	1,269,077	60,730	108,507	32,077	62,109	15,572	54,735	1,909.8	1,388,834		

\* Last half of June estimated.



# Summary of FIELD ACTIVITIES

## *April, May & June*

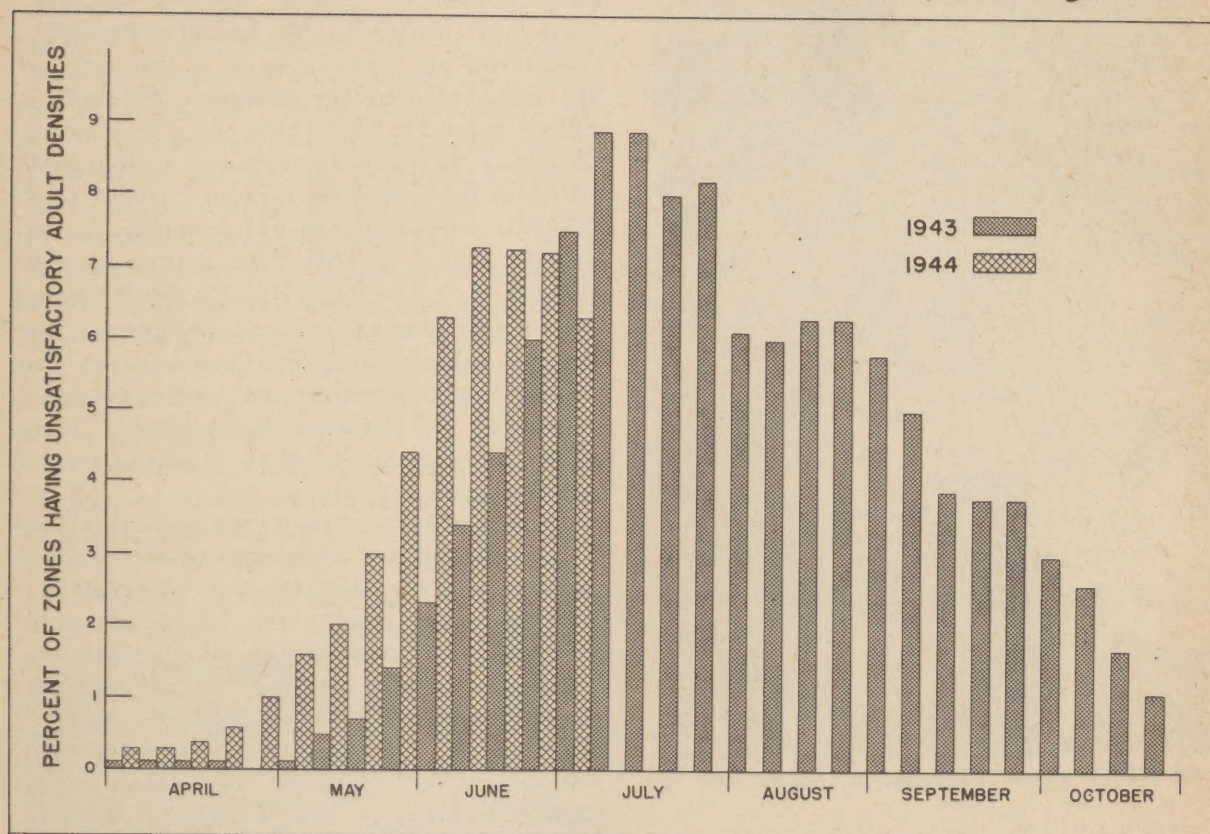


Fig. 1. Unsatisfactory zones for 1943 compared with those for the present season

Figure 1 is a comparison of results for 1943 and 1944 with special reference to the number of zones which have not been satisfactorily controlled. Early in the present season the situation was viewed with considerable concern because the percentage unsatisfactorily controlled in 1944 was more than twice the percentage unsatisfactorily controlled in 1943 for the corresponding weeks. However, as is shown on the chart, later developments reveal that this increase is due only to an earlier season, and present control measures should prove adequate to meet the situation. This year many of the zones reporting high inside densities are new zones, principally prisoner of war camp sites, in which control results are not as yet realized. The older zones should be

comparatively lower this year because of the cumulative effect of previous control measures.

The success of the Malaria Control in War Areas program has been greatly facilitated by its close relationship with the Army. During the past three months MCWA personnel have attended malaria control conferences of military personnel in several service commands, and the Army has been represented at MCWA conferences. This exchange of representatives has resulted in a more efficient program since duplication of work has been avoided. The fullest cooperative effort exists at the present time from Washington and Atlanta headquarters down to individual projects in war areas.



# DENGUE CONTROL

## in the Hawaiian Islands

BY P. A. ENGR. (R) W. E. GILBERTSON AND P. A. SAN. (R) R. L. USINGER



INTERVIEW PRIOR TO PREMISE INSPECTION

Early in July, 1943, two cases of dengue fever were reported from Honolulu; presumably the disease was introduced through air travel from the South Pacific. Within one month the number of cases had increased so alarmingly that Waikiki was declared off-limits for military personnel. This restriction attracted international attention.

When the first two cases were reported, the Territorial Board of Health took immediate action to prevent the spread of the disease, utilizing inspectors from the Rat and Mosquito Control Squad of the Chamber of Commerce. These men, together with 24 recruits and five soldiers, worked as a crew, covering the city section by section. They made routine exterior premise inspections and suggested to householders methods of eliminating *Aedes aegypti* Linn. and

*Aedes albopictus* Skuse, the two mosquito vectors of dengue in the Hawaiian Islands.

During the latter part of August, at the suggestion of the Surgeon, Central Pacific Area, U. S. Army, high pressure Chemical Warfare decontamination truck sprayers were used to spray undiluted commercial insecticide on all premises in the Waikiki area. At this time assistance was requested of the U. S. Public Health Service; and the officer in charge of the dengue-yellow fever control work of the Public Health Service, and the officer in charge of the Savannah *Aedes aegypti* Control Unit were detailed to organize a control program.

Headquarters were established at the Territorial Board of Health, and the Army Surgeon's Office and the Navy Medical Department were contacted. Then suitable equipment and trained inspectors were assembled. With the 33 men already working on the program, plus 50 soldiers, and 13 men obtained through a hiring campaign, it was possible to put 96 men, completely equipped in the field within two weeks. Preliminary orientation was accomplished in one-half day, through lectures, a movie film, and demonstrations. Standard equipment or suitable substitutes were found by diligent search in Honolulu supply houses. Thirty thousand dollars were made available for dengue control from funds handled by the Public Health and Rat and Mosquito Control Committees of the Chamber of Commerce. The Office of Civilian Defense co-operated in many ways, particularly in supplying automotive equipment.

While inspectors carried out routine mosquito control, close correlation was maintained with the findings of epidemiologists. As each new dengue case was reported, a crew of "trouble-shooters" was sent out to spray and inspect the disease premise and the area immediately surrounding it. A Public Health Nurse visit



ed each dengue patient and set up a bed net to prevent the patient from infecting additional mosquitoes. A case history was obtained to assist in tracing the source of infection.

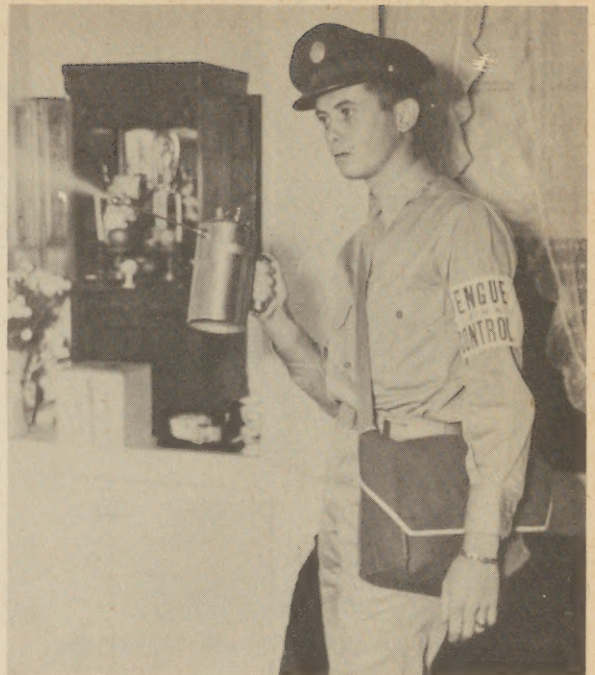
After the number of cases decreased in Waikiki, a flare-up occurred in the congested Kakaako district where a prominent laundry had failed to cooperate in killing adult mosquitoes. Many cases were traced to this spot, and the situation reached a climax when 70 of the laundry employees were out with dengue at one time. The entire Kakaako district was sprayed inside and out with pyrethrum and an emulsifying agent utilizing the decontamination spray rigs of the Chemical Warfare Service. Later on, the Buckle Lane and River Street areas, and other smaller areas, were treated in the same way.

Special activities included vigorous clean-up campaigns in which trash was picked up and hauled away in Army trucks. Thousands of loads of tin cans, bottles, and other breeding containers were eliminated in this way. Catch basins were oil-



CLEARING A ROOF GUTTER BREEDING PLACE

ed by outfitting a motorcycle spray rig. Roof gutters were cleaned by a special crew, and mosquito fish were stocked in ponds wherever this measure seemed necessary. Tree holes and rock holes proved very troublesome during the height of the rainy season so a crew was detailed to fill these holes and thus permanently eliminate such breeding. Tropical garden



INTERIOR SPRAYING

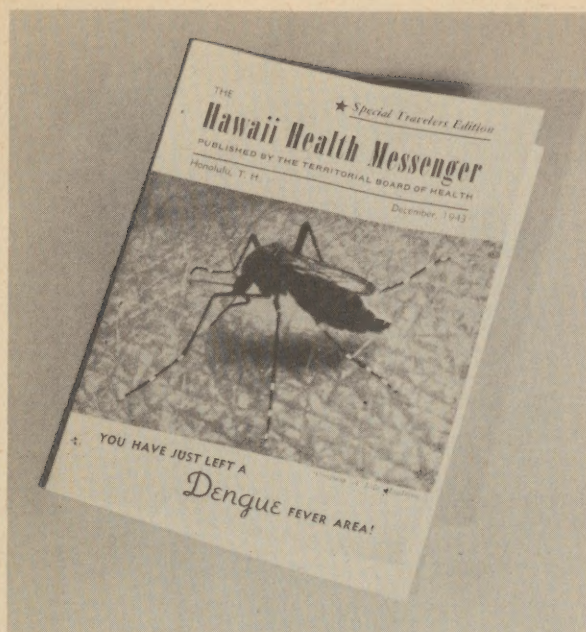
plants proved to be common breeding places because a pint or more of water collects at the bases of leaves of aloe plants, pineapple lilies and spider lilies.

Very early in the program, the danger of spreading the disease from Oahu to the outside islands was realized. Inspections were conducted around the airports and



TREATING WATER IN SPIDER LILY PLANTS





#### WARNING TO INTER-ISLAND TRAVELLERS

techniques of disinsectization of airplanes were reviewed and suggestions were offered. Pyrethrum bombs were obtained from the Army and loaned to the Hawaiian Airways for more effective spraying of planes. Notices were given to inter-island passengers, requesting that after arrival on an outside-island they watch for special symptoms and report any illness promptly to their local health authorities.

Educational activities were vital in the successful operation of the program, and every available means of contacting the public was utilized. A special student survey was conducted through the Director of Health Education of the public schools. Over 25,000 separate inspections were made by students in their own homes, and over 30,000 water-holding containers, of which 5,000 contained mosquito wrigglers, were located and eliminated. Radio spot announcements were prepared, and time in his weekly broadcast was given by the President of the Board of Health. Newspapers carried front-page accounts each day of the number of cases. Business houses throughout the city incorporated dengue publicity in their advertisements. Since three-quarters of the population is of foreign ancestry, publicity had to be issued in the Japanese, Chinese, Philippine,

and Korean languages. A two-minute movie trailer was prepared through the cooperation of the Army Signal Corps and the Navy photographic laboratory. This sound movie trailer was shown in 60 theaters in the Territory of Hawaii. Posters were exhibited in store windows, cards were placed in busses, and stuffers were put in packages and in bills of utility companies.

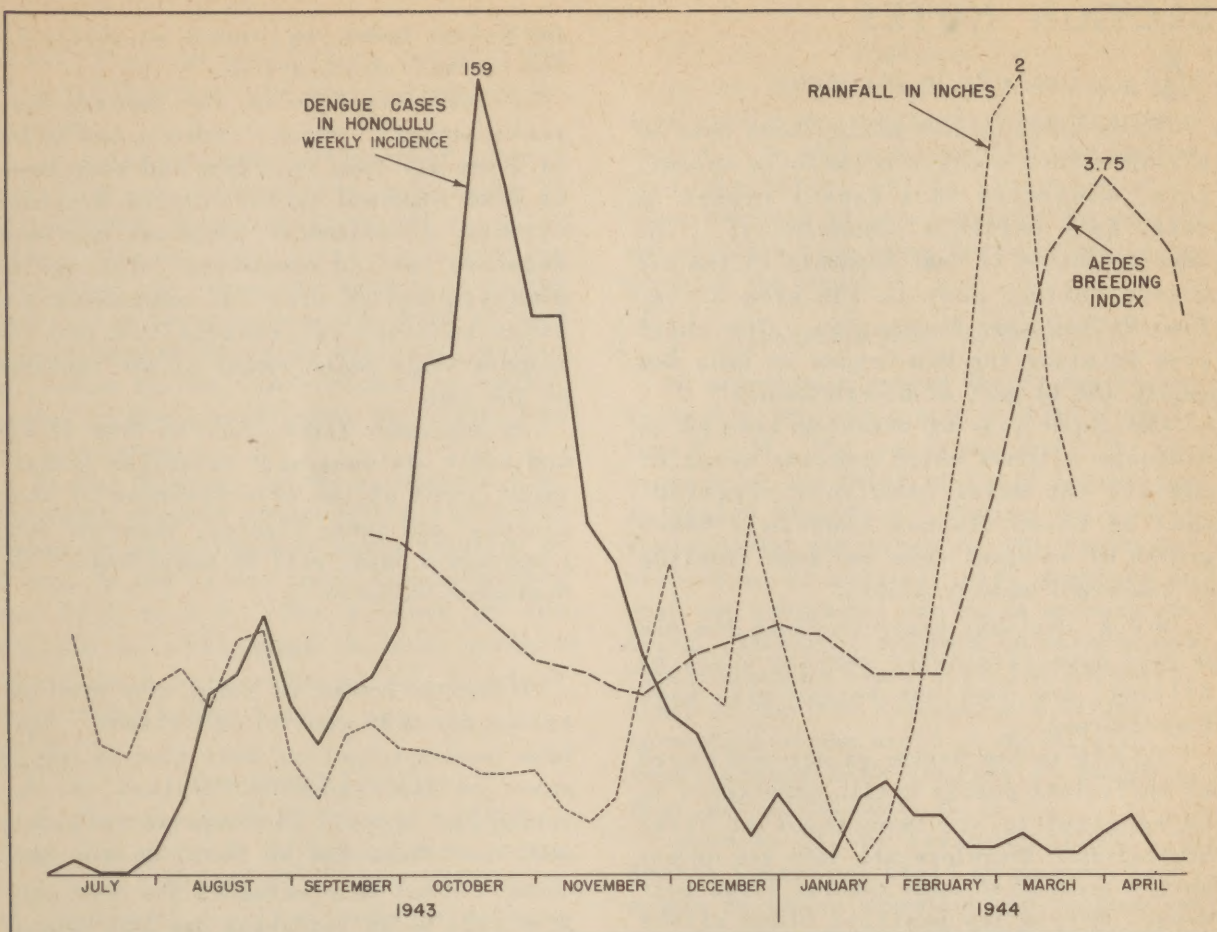
Despite all efforts, dengue spread to rural Oahu and later to the outside islands so that it became necessary to expand the military personnel rather than release such men. A troop of colored soldiers was most helpful in this work on the outside islands. Colored inspectors worked under their own officers as a special unit. These troops proved to be very interested in the work and made satisfactory inspectors. The entire Hawaiian dengue program now numbers approximately 400 men covering 50 cities, and there is little likelihood that work can be decreased with any safety in the near future.

The proof of any control program is measured by the results obtained. The Hawaiian dengue epidemic, starting in July from two recorded cases, built up to a



TREATMENT OF A HOUSE PLANT WITH PHENOTHIAZINE





TREND OF DENGUE CASES COMPARED WITH RAINFALL AND AEDES BREEDING INDEX

maximum of 159 cases per week during October. Since that time the number of cases has steadily decreased to its present level of less than five cases per week. Strangely enough, dengue occurred in Honolulu in almost inverse ratio to the mosquito breeding index. A single mosquito in a congested area with poor housing and poor screening is sufficient to infect a large number of people, whereas many mosquitoes in the well-to-do residential districts do not fly the long distances between residences. Consequently, dengue died out without secondary cases after a mild flare-up in Nuuanu Valley, while it persisted for an uncomfortably long time after all breeding had been eliminated in the congested Kakaako area.

It was felt at the start that the first objective of the program should be the prevention of an explosive outbreak that

would cripple the whole territory and seriously hinder military operations throughout the Pacific theater of war. This objective has been accomplished. The next step is to eliminate dengue completely, and this is proving to be a slow job. The dominant vector, *Aedes albopictus* Skuse, breeds throughout the dense forests up to 2000 feet, so elimination of this vector from the entire Territory is impossible. On the other hand, it has been demonstrated that breeding can be reduced to a satisfactory level wherever sufficient effort is devoted to the job. Final elimination of the disease demands continued effort and prompt reporting of cases. Reintroduction of dengue is likely because of cases returning from the South Pacific, so constant vigilance and a thorough, routine mosquito control program will be necessary for the duration.



## SECTION NOTES



### Malaria in New Mexico

Three areas in New Mexico have been or are important centers of malaria endemicity, according to a recent report by Asst. San. Melvin H. Goodwin, Jr. The most important is near Espanola in the Rio Grande Valley, next is the area of San Juan Valley near Farmington. The third area is along the Rio Grande in Dona Ana County and in part of Sierra County.

The chief type of breeding area is in drainage ditches which provide means of run-off for water used in irrigation. Most of these ditches contain a heavy growth of emergent cane and some floating or submerged aquatic plants.

W.P.A. drainage projects along the Rio Grande have eliminated seepage areas by filling, and numerous borrow pits have been drained.

Malaria in New Mexico is not considered of sufficient public health importance to be reported to the Department of Vital Statistics. Therefore all data are necessarily secured through special field surveys. Only a few positive blood slides were found in such a survey made in 1941.

With the exception of prisoner-of-war camps at Las Cruces and Hatch, no war activities in New Mexico are located in sections believed to be malarious; and a control program has been in operation since 1926 in the county which includes both of these camp sites.



### Jackson Barracks Project Finished

Nine hundred acres of swampland within malaria mosquito flight range of Jackson Barracks will soon be under control, as a result of the largest MCWA drainage project yet attempted. Larvicidal methods including airplane dusting had proved totally inadequate to gain control in the area during two preceeding seasons. A levee has been constructed to keep tidal and wind-tide overflows from wetting the large swamp which is being drained, and a long culvert was jacked under a railroad embankment, which also served as a city

protection levee, to provide an outlet for the dynamite ditch system.

Despite the size of the Jackson Barracks project, which required two miles of levee six feet in height and some twenty five thousand linear feet of drainage ditches, a minimum of manpower has been required for its execution. The use of dynamite and of dragline equipment and other machines was responsible for the comparatively small number of men employed on the job.

By September first, reports from larval and adult stations will establish statistical proof of the effectiveness of this project; and these figures, together with comparative data, will be published in the September Bulletin.

### Jeeps

A limited number of jeeps have been obtained for MCWA control operations. They have been modified and outfitted as mobile power or hand sprayers, dusters, or insecticidal units. Pictures of variously modified jeeps can be found on the back cover. Their main value to the MCWA program will be in relieving the shortage of light truck equipment, and in reaching spots inaccessible to light trucks. Manpower will be saved because two men can cover more area in a day with a jeep than would be possible on foot.

### Boat Trailers

Some states are finding it increasingly useful to haul small boats - mounted on a two-wheel trailer - for larviciding miscellaneous breeding areas that can be more effectively or more economically controlled from boats than from land.



### Aegypti Education Program

The *Aedes aegypti* mobile unit, fully equipped with window displays, leaflets, specialized training films, and other educational material, visited various non-project cities during the past three months. More than 600,000 homes representing approximately 2,000,000 persons were reached in a campaign that began at



Miami, Fla. and moved along the Gulf and Atlantic Coasts as the breeding season developed.

In a typical non-project city special training and instructions were given to OCD workers, school children and all civic organizations. The local radio station saturated the community with anti-dengue and yellow fever information with 25 spot announcements daily as well as a series of radio forums, interviews, or talks. Movie trailers were shown for three days in local theaters.

In San Antonio, Texas, a complete educational program sponsored by the local community on a city-wide basis resulted in a drop in the vector index from a dangerous 10.0 to 2.4. The success of the program was attributed in large measure to complete cooperation of civic, school and medical authorities.



#### Complement Fixation

P. A. Surgeon B. K. Milmore and Associate Sanitarian W. L. Loving were in New York June 9 and 10 to discuss the future of complement fixation tests in malaria surveys with Dr. Mahoney and Mr. Ad Harris. It appears that a more satisfactory antigen must be obtained before the specificity of a technique utilizing it can be tested. The antigen now being used is not highly refined and gives inconstant results.

#### Spleen Survey Complete

Tabulation of P. A. Surgeon Robert L. Smith's spring, 1944, spleen survey was completed in June. A significant difference was noted between the number of size 1 and larger spleens in Arkansas and those in Massachusetts or New York.



#### Field Manual to be Released

The In-Service Training Section has recently prepared a well-illustrated entomological handbook designed primarily to guide inspectors and area supervisors in carrying on inspectional phases of the MCWA program. This book will be released about the first week in August.

#### Trainees

In the past three months fourteen men have completed the In-Service Training program. In addition, one visiting Fellow from the Office of the Coordinator of Inter-American Affairs attended the course, and visitors from other Services sat in on parts of the course.



#### Educators Meet in Memphis

An orientation course for 23 Assistants in Health Education was held in Memphis June 7 - 17. The course was under the direction of the Chief of Field Activities in Health Education. During the course instruction was given on the cause and prevention of malaria, with emphasis on what the individual can do to prevent malaria. Technical training on malaria was contributed by members of the technical staff of the MCWA Headquarters Office, and by members of the staff of the Malaria Investigations Laboratories at Memphis, Tenn. and at Columbia, S. C.

Members of the Field Activities in Health Education staff discussed techniques of health education and lectured on the use of newspapers, radio, and motion pictures. The city editor of a Memphis paper talked on using newspapers in public health education. Representatives of the Agricultural Extension Service led a roundtable discussion on methods of conducting a malaria education program in conjunction with the Agricultural Extension Service.

After this ten-day program, the educators returned to MCWA areas where they will carry on their summer field work.


#### A County-Sponsored Educational Program

In Blytheville County, Arkansas, 4243 students in 91 schools were reached through an educational program launched just prior to the *Anopheles* breeding season. Talks were given and film strips were shown in school assemblies. Existing malaria units in various schools were supplemented, and other schools were encouraged to include malaria units in their curricula. This campaign should result in a decrease in the summer malaria incidence.



## HEADQUARTERS NOTES

### Santee Cooper Survey

 San. Engr. (R) Nelson H. Rector is in charge of an extensive survey in cooperation with the South Carolina Board of Health and the Santee Cooper Authority. Since records of a recent blood survey in one county reveal 38.3% positive, the need for control work seems obvious. Data obtained from the land within one mile of the Reservoir will be compared with that from areas outside the reservoir zone to show the effect of the reservoir on the territory as a whole. After the study is completed, recommendations will be submitted as to methods of control. Moncks Corner Ordnance Plant is the major war establishment in the area.

MCWA personnel assisting in these surveys are as follows: Assistant Sanitary Engineers (R) James Turnbull, Davis S. Butler, and Marshal V. Rainey; Assistant Sanitarians (R) C. E. Kohler, Curtis W. Sabrosky, and John C. Russell; Inspectors W. J. Tatum, Harry E. Dixon, E. Miller Boykin, and Ellison C. Nelson, Jr.

### Foreign Malaria

Malaria in the civilian population has received considerable attention during the past few months. A constantly increasing number of soldiers are returning as malaria carriers and are intermingling with civilians in areas where malaria transmitting mosquitoes are prevalent. All MCWA resources will be utilized to subdue explosive epidemics that may occur.

### Commissioned

Newly commissioned officers are Sanitarian (R) Travis E. McNeel and Jr. Asst. San. (R) James G. Mazza.

### Assigned from Headquarters Office

San. Engr. Gordon E. McCallum, formerly Asst. Chief of the Division of Operations, left the latter part of June to assume new duties in the District Office at San Francisco. Asst. San. Engr. (R) Richard P. Lonergan was assigned to Berkeley, Calif.

Asst. San. Engineer H. L. Ludwig has

just been assigned to UNRRA and will be going overseas in the near future.

After completing a course of in-service training, ten officers were assigned as follows: Jr. Asst. Engr. (R) John D. Parkhurst to Panama City, Fla.; Jr. Asst. Engr. (R) William B. Schreeder to Pryor, Okla.; Jr. Asst. Engr. (R) R. E. Smith and Asst. Engr. (R) Samuel Schneider to New York, N.Y.; Asst. Engr. (R) William S. Wilson to Columbia, S.C.; Jr. Asst. San. (R) Thomas W. Haines to Columbia, S.C.; Asst. San. (R) A. O. Garr to Tampa, Fla.; Jr. Asst. San. (R) John W. Shipp to Corpus Christi, Texas; and Jr. Asst. San. (R) James C. Williams to Baton Rouge, La.

Asst. Engr. (R) Lee D. Dumm was transferred to McGehee, Ark.; and San. (R) Eli Abbot went to New Orleans as MCWA Engineer for District 4.

### Now in Atlanta

P. A. San. Engr. (R) Howard L. Grant, from New Orleans, Asst. Engr. (R) J. Paul Welsh, from Montgomery, and P. A. Engr. (R) Curtis G. Humphreys, from San Juan, were among arrivals at the Headquarters office.

### Change of Station

The following changes of station assignments were announced during the past three months.

To the Carter Memorial Laboratory in Savannah, Ga. went Asst. Engineers (R) Harry F. Johnson and Harry Stierli, Asst. San. (R) Richard W. Fay, and P. A. San. (R) William A. Moore.

Investigations on quad control will be conducted by San. (R) Frank W. Fisk and Asst. San. (R) Robert H. McCauley, Jr., in Stuttgart, Arkansas.

Asst. Sanitarians (R) R. G. Rosensteil, Harold H. Dodge, and Woodrow W. Farrar went to Berkeley, Sacramento, and Whittier, California respectively, in connection with the mobile unit program.

Asst. San. (R) George B. Vogt was transferred from Baltimore to Cantonsville, Md. Asst. San. (R) Walter C. Baker left New York for Fort Dix, N. J. P. A. Engr. (R) Ernest P. Dubuque was transferred from Chicago, Ill. to Battle Creek, Mich.



TABLE II. MCWA EXPENDITURES AND LIQUIDATIONS BY MAJOR ITEMS, APRIL, MAY, JUNE 1944

	Continental U.S.	Percentage of Total	Puerto Rico	Percentage of Total
.01 Personal Services	\$1,254,149.59	67.27	72,926.29	87.04
.02 Travel	56,089.00	3.00	369.15	0.44
.03 Transportation of Things	10,359.98	0.56	-----	-----
.04 Communication Services	3,322.42	0.18	42.95	0.05
.05 Rents and Utilities	5,410.48	0.29	-----	-----
.06 Printing and Binding	25.00cr.	-----	-----	-----
.07 Other Contractual Services	142,758.84	7.67	-----	-----
.08 Supplies and Materials	148,846.84	7.98	8,940.70	10.68
.09 Equipment	243,254.09	13.05	1,500.00	1.79
Total	\$1,864,166.24	100.00	83,779.09	100.00
Expenses other Than Personal Services	\$ 610,016.65	32.73	10,852.80	12.96

TABLE III. MCWA PERSONNEL ON DUTY AND TOTAL PAYROLL, APRIL, MAY, JUNE 1944

STATE	Commissioned		Prof. & Sci.		Sub-Prof. (1)		C. A. F.		Custodial		Total		Percent of Total	
	No.	Pay	No.	Pay	No.	Pay	No.	Pay	No.	Pay	No.	Pay	No.	Pay
Alabama	15	4,152	3	792	12	2,010	7	1,327	133	15,997	170	24,278	1.8	1.8
Arkansas	21	6,389	15	4,438	85	11,970	13	2,528	370	40,745	504	69,070	5.3	5.2
California	6	1,704	---	---	22	4,305	9	1,566	49	7,220	86	14,795	0.9	1.1
D. C.	3	997	---	---	12	2,343	5	1,532	15	2,025	35	6,897	0.4	0.5
Florida	19	5,742	16	4,724	53	10,470	18	2,935	601	77,544	707	101,415	7.4	7.5
Georgia	29	8,269	7	2,149	106	20,411	20	3,238	305	39,440	467	73,607	4.9	5.5
Illinois	15	4,103	5	1,491	2	341	3	728	37	3,547	62	10,210	0.6	0.6
Indiana	6	1,704	---	---	1	183	---	---	25	3,290	32	5,177	0.3	0.4
Kentucky	9	2,582	8	1,703	30	4,562	6	852	39	5,152	92	11,851	1.0	1.1
Louisiana	29	8,531	14	4,720	135	25,531	18	3,480	1,016	128,920	1,212	171,182	12.7	12.8
Maryland	6	1,595	---	---	14	2,622	6	1,296	39	4,994	65	10,507	0.7	0.8
Mississippi	20	5,809	12	2,245	42	8,009	13	1,866	322	40,945	409	58,874	4.3	4.4
Missouri	6	1,943	---	---	40	7,342	3	743	84	9,628	133	19,656	1.4	1.5
North Carolina	15	4,310	17	5,612	31	5,801	8	1,355	565	69,466	636	86,544	6.6	6.5
Oklahoma	9	2,632	4	1,210	31	6,269	3	438	149	16,239	196	26,788	2.0	2.0
Puerto Rico	24	8,131	3	969	22	5,245	16	3,520	1,162	55,059	1,227	72,924	12.8	5.4
South Carolina	14	4,317	15	4,518	79	16,662	10	2,596	840	103,385	958	131,478	10.0	9.8
Tennessee	12	3,410	6	1,431	18	4,380	7	1,449	178	19,964	221	30,634	2.3	2.3
Texas	18	5,164	16	5,014	73	15,988	15	2,303	660	82,381	782	111,350	8.2	8.3
Virginia	9	2,557	6	2,080	55	9,889	7	1,393	435	54,726	512	70,645	5.3	5.3
<u>AELES AEGYPTI</u>														
Alabama	1	289	---	---	26	4,569	2	433	---	---	29	5,296	0.3	0.4
Florida	---	---	---	---	103	17,700	4	664	3	380	110	18,744	1.1	1.4
Georgia	11	3,333	5	1,197	25	4,983	6	822	5	547	52	10,882	0.5	0.8
Louisiana	4	1,185	3	792	47	7,060	3	438	---	1,221	57	10,696	0.6	0.8
South Carolina	3	853	---	---	33	5,949	3	492	3	375	42	7,669	0.4	0.6
Texas	14	4,164	3	678	75	14,292	3	524	27	3,593	122	23,251	1.3	1.7
H.Q. & Dist. (2)	217	70,924	11	7,435	73	14,495	306	52,179	50	6,059	657	150,992	6.9	11.3
Total	535	164,689	169	53,198	1,245	236,381	514	91,302	7,112	792,842	9,575	1,338,112	100.0	100.0
Percent of Total	5.6	12.3	1.8	4.0	13.0	17.7	5.4	6.8	74.2	59.2	100.0	100.0		

(1) Includes Entomological Inspectors

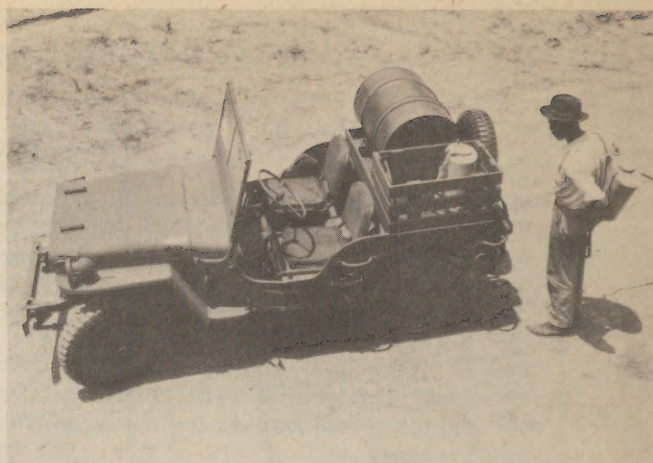
(2) Includes Headquarters and District Offices, malaria survey, imported malaria control, special investigations and employees temporarily attached to Headquarters pending assignment to states.

NOTE: NO. OF PERSONNEL SHOWN IN TABLE  
III IS CUMULATIVE FOR THREE MONTHS.





Power Dusting from Jeep



Jeep Outfitted for Hand Spraying Crew



Power Spraying from Jeep



Jeep with Hand Dusting Equipment



MCWA Jeeps Outfitted with Power Dusters and Oilers and Hand Oiling Equipment